

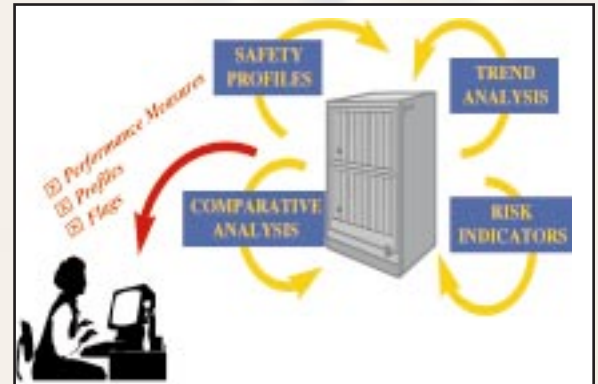
Aviation Safety Risk Analysis Program

The Federal Aviation Act of 1958 and the Code of Federal Regulations (CFR) provide the FAA with the statutory authority and responsibility to conduct surveillance of air operators, air agencies, aircraft, and air personnel to assure conformance with the CFR and aviation safety standards.

The Aviation Safety Risk Analysis Program (ASRAP) is developing analytical and decision support tools to provide FAA aviation safety inspectors and certification engineers the capability to systematically assess potential risks and to take proactive steps to reduce the rate of aviation-related accidents and incidents. By targeting its resources based on risk, the FAA will be able to increase its leverage of aviation safety inspector and certification engineering resources.

ASRAP focuses on:

- Developing rapid prototyping techniques and software tools for use in generating new safety critical performance measures, displaying information, and facilitating analysis. These measures, encompassing particulars about aircraft design, aircraft maintenance, discrepancy reports, air carriers, air agencies, and air personnel, are to be embedded in decision support systems such as the Safety Performance Analysis System (SPAS).
- Investigating the use of artificial intelligence techniques, such as neural networks and experts systems, coupled with advanced statistical techniques to improve aviation safety analysis.



- Developing and enhancing safety assessment methods for certification and continued airworthiness of civil aircraft.
- Developing advanced analytical and graphical techniques that will allow the FAA to more effectively and efficiently use information contained in various FAA and industry databases.
- Improving the aviation safety monitoring and oversight process through the identification and testing of FAA and industry major attributes (i.e., characteristics) of safety and the relevant data that are required.
- Developing techniques to improve the quality of aviation safety data, collection procedures, and terminology.

Maximizing the sharing of good quality information would alert both the FAA and industry of pending aviation safety-related problems. Analytical and decision support tools rely on good quality data to identify the potential safety risk areas. By developing a certification and surveillance program that is built on targeting resources to address safety risks, corrective action would be taken sooner. Thus, the primary beneficiary of this effort is the general flying public.



Several of the analytical tools, e.g., SPAS, will also be used by the Department of Defense (DoD) in their oversight of DoD contract carriers and charters. The FAA is working with Helicopter Association International to enhance their Maintenance Malfunction Information Reporting (MMIR) System. This software tool improved the collection, storage, and transfer of service difficulty reports and part warranty information. It is a goal of the ASRAP program to expand the use of MMIR to other type operators, e.g., air taxis.

The work is carried out by FAA staff, contractors, and academia. The work, from determining system requirements to developing interface standards for constituent systems, is performed in conjunction with Flight Standards and Aircraft Certification users and industry working group subject matter experts ensuring that the initiative will fulfill user needs. Additional expertise is provided by the US Air Force, the Department of Transportation (DOT), and the Department of Energy (DOE) through interagency agreements. Support from the Flight Safety Foundation and academia is sought through the use of cooperative grants and agreements.

Joint Application Requirement/Joint Application Design (JAR/JAD) is the process used to more fully define the user requirements and the ultimate screen displays. During the JAR and JAD sessions, developers work with the subject matter experts. Mockups and rapid prototypes are the primary display mechanisms used to ensure that the developers have a comprehensive understanding of the requirements. For major system development efforts, an independent verification and validation of the initiative is conducted to ensure that the requirements are met.

Released in 1997, SPAS II is a computer-based risk analysis decision support system to be used by FAA aviation safety inspectors, certification engineers, and DoD aviation analysts. SPAS II includes safety critical performance indicators as well as aviation safety information so that its users can monitor the performance of certificate holders, i.e., air operators, air agencies, aircraft, and air personnel. When fully deployed to all sites (by 1999), SPAS II will extend into foreign cities, such as Singapore, as well as throughout the US.

Released in 1997, the International Aircraft Operators Information System (IAOIS) is a computerized information system which, at the present time, contains detailed information on more than 110,000 fixed-wing aircraft and helicopters as well as information on more than 70,000 aircraft operators worldwide. The IAOIS project was initiated to improve the US Aircraft Registry Information System with higher data quality, state-of-the-art relational database technology, more detailed information on aircraft and operators, and an international scope.

To find out more about the Aviation Safety Risk Analysis Program, contact:

Airport and Aircraft Safety Research
and Development Division
Aircraft Safety Research
and Development Branch
Risk Analysis Section, AAR-424

Federal Aviation Administration
William J. Hughes Technical Center
Atlantic City International Airport, NJ 08405
Phone: (609) 485-8173
Fax: (609) 485-6218

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